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GUIDELINES FOR THE DEVELOPMENT OF TRAINING PROGRAMS FOR AGRICULTURAL TECHNICIANS, A RESEARCH REPORT OF A GRADUATE STUDY. RESEARCH SERIES IN AGRICULTURAL EDUCATION.

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THE OBJECTIVES OF THIS STUDY WERE TO DETERMINE--(1) THE STATUS AND CHARACTERISTICS OF AGRICULTURAL TECHNICIAN TRAINING PROGRAMS, (2) ADMINISTRATORS' DEGREE OF EMPHASIS ON CERTAIN PROCEDURES FOR DEVELOPING SUCCESSFUL PROGRAMS, AND (3) TENTATIVE GUIDELINES FOR USE IN PLANNING AND CONDUCTING PROGRAMS. OF 44 INSTITUTIONS IDENTIFIED AND CONTACTED, 25 REPORTED TRAINING PROGRAMS, IDENTIFIED PROGRAM CHARACTERISTICS, AND REPORTED THE DEGREE OF EMPHASIS GIVEN CERTAIN PROCEDURES. GUIDELINES FOR PLANNING AND CONDUCTING PROGRAMS WERE SYNTHESIZED AND SUBMITTED TO A JURY OF EXPERTS FOR REFINEMENT AND EVALUATION. FURTHER REFINEMENT RESULTED FROM THE INVESTIGATOR'S VISIT TO A NUMBER OF INSTITUTIONS. GUIDELINES, THUS DEVELOPED, WHICH RECEIVED A MEAN RATING OF 3.00 ON A FOUR-POINT SCALE WERE INCLUDED IN THE REPORT AND CONCERNED THE FOLLOWING AREAS--(1) OBJECTIVES, (2) PROGRAM TYPE, (3) CURRICULUM CONTENT, (4) STUDENT RECRUITMENT, (5) STUDENT SELECTION, (6) COUNSELING, (7) PLACEMENT AND FOLLOWUP, (8) RESIDENCE FACILITIES, (9) INSTRUCTIONAL STAFF, (10) FACILITIES AND EQUIPMENT, (11) PROGRAM ACCEPTANCE, (12) EVALUATION, (13) ACCREDITATION AND LICENSING, AND (14) LOCATION. THE 15 CONCLUSIONS INCLUDED--(1) MOST OF THE PROGRAMS WERE IN 4-YEAR COLLEGES, (2) MANY PROGRAMS WERE DEVELOPING IN OTHER TYPES OF INSTITUTIONS, AND (3) MOST PROGRAMS HAD SMALL ENROLLMENTS, BUT COULD BE EXPECTED TO GROW. (JM)

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A Research Report of a Graduate Study

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NATIONAL CONCERN FOR
TECHNICAL EDUCATION IN AGRICULTURE

Introduction

One of the most significant changes in the occupational structure of the United States today is the rapid growth of occupations which lie between the fields of the skilled crafts and engineering. These occupations contain many new jobs of a technical character, varying widely in the scope and level of the tasks performed and in the nature of the activities carried out. The workers in these jobs have come to be known as technicians.

The rapidly changing occupational structure of the nation resulting from expanding automation and technology suggests the need for a thorough and continuing analysis of technical jobs and the training required for them.

The rapidly changing occupational structure in the United States has resulted in a critical shortage of technicians, including agricultural technicians.

The United States Department of Labor recently provided an overview of projections of changes in the population and labor force of the United States between 1960 and 1970. The overview revealed that --

> Workers under 25 will account for nearly half of the labor force growth during the 1960's, even though they will stay in school longer.
>
> .....
>
> The kinds of jobs industry will need workers for are also changing but the biggest increases will occur in the occupations requiring the most education and training.
>
> .....
>
> The fastest growth will occur among professional and technical occupations, especially engineers, scientists and technicians.

While the total labor force will increase approximately 20 per cent between 1960 and 1970, the technical and professional personnel will increase approximately 42 per cent.

Vocational educators in a number of states have indicated that programs for the training of agricultural technicians will be developed in their states within the next five years.

Vocational-technical education is in the process of emerging as a major facet of the educational enterprise. Its purposes, distinguishing characteristics, kinds of institutions needed, administrative structure and curricular offerings (with the possible exception of engineering-related programs) are in a developmental state.

The constantly increasing need for agricultural technicians demands the development of new educational programs for the training of these technicians. Twenty-eight State Directors of Vocational Education recently indicated to this investigator that definite plans were being made in their states for the development of training programs for agricultural technicians within the next five years.

PLANS FOR THE STUDY

The major purpose of this study was to develop guidelines for use in planning and conducting training programs for agricultural technicians.

The following specific objectives were identified to guide the direction of this study:

1. To determine the status and characteristics of present training programs for agricultural technicians.

2. To determine, for the following categories, the degree of emphasis administrators of present training programs for agricultural technicians believe should be given to certain procedures in developing

successful training programs for these technicians.

a. Objectives of the program

b. Types of programs offered

c. Curriculum content

d. Recruitment

e. Student services

(1) Selection
(2) Counseling
(3) Placement and follow-up
(4) Residence facilities

f. Library

g. Instructional staff

h. Facilities and equipment

i. Acceptance by industry, business and educational leaders

j. Evaluation

k. Accreditation and/or licensing

l. Location

3. To synthesize, refine, and evaluate a tentative set of guidelines for use in planning and conducting training programs for agricultural technicians.

PROCEDURE FOR THE STUDY

A check list of procedures was developed and mailed to institutions in the United States training agricultural technicians for the purpose of determining the degree of emphasis which should be given to the procedures in successfully developing training programs for these technicians.

A tentative set of guidelines for planning and conducting training programs for agricultural technicians was synthesized and submitted to a jury of experts for refinement and evaluation.

Visits were made by the investigator to several institutions training agricultural technicians to secure additional information for the

further refinement of the tentative guidelines.

The investigator used the literature on the development of training programs for technicians, the evaluation of the tentative guidelines by the jury along with their additions and other comments, the study of the status and characteristics of present training programs for agricultural technicians, the reactions of the institutions' representatives as to emphasis which should be given to procedures in the successful development of training programs for agricultural technicians, and the information and ideas gained while visiting a number of these institutions as a basis for refining the tentative set of guidelines for the development of training programs for agricultural technicians.

SURVEY OF CURRENT TECHNICAL PROGRAMS IN AGRICULTURE

The institutions used in this study were identified through state directors of vocational education, the U. S. Office of Education and published educational directories. Forty-four institutions were identified for contact. Twenty-five institutions reported training programs for agricultural technicians and responses from these institutions used in the study. Four other institutions indicated programs but were parts of four year colleges of agriculture and thus eliminated from the study. One institution was listed as a technical high school. Thirteen of the original institutions reported they did not have training programs for agricultural technicians. One institution did not respond. Responses were received from ninety-eight per cent of the original forty-four institutions.

Types of institutions

The types of institutions in which there were programs for the

training of agricultural technicians could be classified into four general categories: technical institutes, junior colleges, comprehensive community colleges and area vocational-technical schools.

The number of institutions in the study and the percentage of the total according to type of institution are shown in Table 1.

As Table 1 shows, there were more technical institutes with training programs for agricultural technicians than any other type of institution. Junior colleges were second.

TABLE 1.--Institutions identified in this study with training programs for agricultural technicians according to type of institution

Type of Institution	Number	Per Cent of Total
Technical Institute	12	48
Junior College	8	32
Comprehensive Community College	3	12
Area Vocational-Technical School	2	8
Total	25	100

Types of programs currently in operation

Representatives of institutions participating in the study were asked to identify the types of training programs for agricultural technicians currently in operation in their institutions. They were requested to specify the names of the programs. Table 2 summarizes information received concerning training programs currently in operation according to the type of institution in which the program was located.

TABLE 2.--Training programs for agricultural technicians currently in operation according to type of institution

Type of Program	Type of Institution				
	Technical Institute	Junior College	Comprehensive Community College	Area Vocational-Technical School	Total
Agricultural Business and Management	11	5	1	0	17
Animal Science Technology	10	3	1	0	14
Horticultural Technology	6	3	1	0	10
Agricultural Engineering Technology	4	2	1	1	8
Agricultural Technology	4	2	0	0	6
Plant Science Technology	2	0	1	0	3
Forestry Technology	0	0	0	1	1
Total	37	15	5	2	59

Total number of students currently enrolled in programs

The number of students currently enrolled in different types of training programs for agricultural technicians is shown in Table 3.

The information presented in this table includes advanced students as well as those who entered programs in the fall of 1963.

Several of the programs indicated significant increases in enrollments from the first year the programs were in operation until now. Those institutions still in their initial year of training

agricultural technicians reported the same number currently enrolled as in the beginning class or a smaller number due to withdrawals during the year.

TABLE 3.--Number of students currently enrolled in training programs for agricultural technicians according to type of program

Type of Program	Total Number Currently Enrolled				Total
	Less Than 20	21-40	41-60	61 or More	
Agricultural Business and Management	11	3	0	0	14
Animal Science Technology	4	1	1	1	7
Horticultural Technology	3	0	1	0	4
Agricultural Technology	2	0	1	1	4
Agricultural Engineering Technology	0	2	1	0	3
Plant Science Technology	0	1	0	0	1
Forestry Technology	0	0	1	0	1

Awards given for successful completion of the program

All institutions participating in the study indicated that some award was given to students successfully completing the training program. The respondents were asked to indicate the type of award given.

Table 4 shows that the associate degree was the type of award given by a large majority of the institutions.

TABLE 4.--Type of award given for successful completion of training programs for agricultural technicians according to type of institution

Type of Institution	Type of Award		
	Associate Degree	Diploma	Certificate
Technical Institute	9	2	1
Junior College	6	1	1
Comprehensive Community College	3	0	0
Area Vocational-Technical School	0	0	2
Total	18	3	4

Other Training Programs for Agricultural Technicians

Not all agricultural technicians are trained in the institutions which constitute the population used in this study. This study was limited to public institutions which trained agricultural technicians and there may be private institutions with such training programs. Also, large agricultural businesses and industries may operate training programs in connection with the business or industry and train personnel to operate at the technician level.

A number of colleges in the United States operate agricultural institutes or other types of training programs as part of their colleges of agriculture and these train personnel at the technician level. These institutions were not asked to participate in this study because the investigator and others with whom he conferred believed

the problems and procedures of these institutions in developing and conducting training programs for agricultural technicians would be sufficiently different to warrant their exclusion from the study.

Further analysis of data showed that most of the institutions were relatively small but a small portion had student bodies numbering into the thousands. Generally these institutions had quite small part-time student enrollments and extension student enrollments were practically nonexistent.

Almost all the institutions were accredited by either a state or a regional agency but practically none were licensed.

Most of the institutions provided several types of student services for prospective students, enrolled students and graduates.

Twenty-eight State Directors of Vocational Education indicated to the investigator early in the study that definite plans were being made in their states for the development of new or additional training programs for agricultural technicians within the next five years. The institutions in this study indicated that 21 additional training programs were already in the planning stages.

Summary of the guidelines

All the guidelines developed in this study, along with the modal response(s), mean ratings of response(s) and standard deviations, are summarized in Table 5.

TABLE 5.--Summary of guidelines developed in this study for planning and conducting training programs for agricultural technicians in post-high school educational institutions

Guidelines	Modal Response(s)	Mean Rating of Responses[a]	Standard Deviation
1. Agricultural technician training program objectives should reflect the unique characteristics of technical education of less than the baccalaureate degree, but above the high school level.	4	3.85	.3619
2. The types of agricultural technician training programs to be offered should be determined with primary but not exclusive attention to occupational (job opportunity), educational and interest surveys of people and industries to be served.	4	3.57	.6253
3. Curriculum content for agricultural technician training programs should be closely related to present and future occupational needs.	4	4.00	.0000
4. A planned recruitment program should be developed to acquaint prospective students with the opportunities for becoming trained as agricultural technicians and for employment upon successful completion of this program.	4	3.46	.6325
5. Selection of students for agricultural technician training programs should be based on interests, aptitudes, previous education, intellectual capacity and background experience - the criteria varying with the occupations for which training is given.	4	3.86	.5167
6. Institutions providing agricultural technician training programs should develop an adequate counseling and guidance program, coordinating it with counseling programs of local schools and the Employment Security Commission.	3,4	3.50	.5000

TABLE 5.--Continued

Guidelines	Modal Response(s)	Mean Rating of Responses[a]	Standard Deviation
7. Placement and follow-up services in agricultural technician training programs should result in graduates being placed in the jobs for which they were prepared and also provide information for proper analysis of program effectiveness.	4	3.69	.4637
8. Residence facilities should be made available for students when sufficient need is demonstrated based on the opportunity of students to obtain programs of their choice which are not available to them otherwise and when the addition of these facilities serves as a means to enable the institution to more fully meet its objectives.	3	2.71	.7962
9. Students enrolled in agricultural technician training programs should have ready access to a well-organized, appropriately coordinated library which provides a ready reference to up-to-date information and which has an appropriate range of authentic and professional publications in the area of work for which technicians are being trained.	4	3.79	.4074
10. The instructional staff in agricultural technician training programs should have technical occupational competence in the area for which training is offered and should understand and be proficient in teaching skills and competence essential to successful performance as an agricultural technician.	4	3.82	.3619
11. Adequate and appropriate facilities and equipment are essential and should be made available in the training of highly competent agricultural technicians.	4	3.92	1.0025

TABLE 5.--Continued

Guidelines	Modal Response(s)	Mean Rating of Responses[a]	Standard Deviation
12. Planned and continuous efforts should be made to increase the acceptance and prestige of technician occupations (including agricultural technicians) and technician training programs.	4	3.31	.7204
13. Continuous and planned programs of evaluation should be characteristic of agricultural technician training programs.	4	3.77	.4243
14. Agricultural technician training programs should become accredited and/or licensed as early as possible by a recognized accrediting or licensing agency in order to assure the public that some kinds of recognized standards are being met and to protect graduates from pseudo-technician graduates.	4	3.31	.7204
15. Agricultural technician training programs should be located in institutions in areas of population and agricultural industry and business concentration so as to be readily accessible to those whom they are designed to serve.	3,4	3.46	.4960

[a]Scale:

Very Much	Much	Some	Little	None
4	3	2	1	0

An extensive survey of the literature concerning educational programs for the training of technicians provided the basis for drafting a very tentative list of guidelines and supporting statements. These were submitted to a small advisory committee for refinement.

A national jury of leading educators was selected by the

investigator to further refine the guidelines and to evaluate both the guidelines and the supporting statements. The tentative list of guidelines only was submitted to the jury with a request for help in refining them. They were asked to indicate need for clarity or further amplification of the submitted guidelines and to suggest additional guidelines needed.

The investigator used the suggestions from the jury in redrafting the guidelines. The supporting statements were then added to the guidelines. Both the guidelines and supporting statements were scaled and submitted to the jury for evaluation.

Summary of data concerning guidelines and supporting statements

The following guidelines and supporting statements were evaluated by the jury to warrant a mean rating of 3.00 or higher (indicating of much or very much importance) on an importance scale. The supporting statements corresponded to procedures statements which were rated by representatives of institutions with training programs for agricultural technicians. The supporting statements, unless otherwise noted, also correspond to procedures which were given mean ratings of 3.00 or higher (indicating much or very much emphasis should be given to them in developing successful training programs for agricultural technicians) on an emphasis scale. The guidelines were rated only by the jury. The supporting statements, in effect, were rated by both the jury and representatives of the institutions.

Objectives

GUIDELINE: Agricultural technician training program objectives should reflect the unique characterisitcs of technical education of less than the baccalaureate degree, but above the high school level.

a. The objectives should be such that resulting curricula are primarily occupation-centered and planned toward occupational competence for the graduate.

b. Clearly defined and realistic objectives for the training programs should be developed under the guidance of a professional educator assigned to give leadership in this area.

c. Lay personnel in agricultural businesses and industries should be involved in the development of objectives for agricultural technician training programs.

d. A major objective of the training program should be to prepare the student for immediate productive employment in the technician occupations for which training is provided.

e. The objectives should allow for preparation of students for clusters of related technician occupations.

f. The objectives should be in harmony with the legal bases on which the institution was founded.

Types of programs offered

GUIDELINE: The types of agricultural technician training programs to be offered should be determined with primary but not exclusive attention to occupational (job opportunity), educational and interest surveys of people and industries to be served.

a. An advisory committee including representatives of the agricultural businesses and industries should carefully plan any surveys made.

(1) The main purpose to be served by each survey should be determined before instruments for it are developed.

(2) The precise information desired should be determined and instruments developed to assure its being obtained.

(3) Sufficient funds and/or time should be budgeted for making the surveys.

(4) A well-qualified person to direct the survey should be carefully selected.

(5) The sources of information should be carefully selected.

(6) Consultant help in field research should be obtained in developing the survey plan and guide.[1]

b. Extensive and dependable information and data are needed, including:

(1) The identification of jobs or occupational clusters dependent upon agricultural technician training programs.

(2) The types and number of employment opportunities currently available and those realistically expected over a given period of time.

(3) The amount of support employers will give to the program.

(4) Other available sources of education and training for the particular area under consideration.[2]

(5) The number of potential students who are now interested and would enroll in the program.

c. The survey findings must be carefully analyzed to determine what agricultural technician training curriculums should be established.

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[1]Received less than a mean rating of 3.00 by the institutions.

[2]Received less than a mean rating of 3.00 by the institutions.

(1) Specialized consultant help should be secured in analyzing and interpreting the survey data.[3]

(2) Advisory committees should be involved in analyzing and interpreting the survey data.

Curriculum content

GUIDELINE: Curriculum content for agricultural technician training programs should be closely related to present and future occupational needs.

a. Curriculum content should be primarily occupation-centered.

b. A balance between technical-supporting content and class-laboratory experiences is essential for learning concepts and principles and their application.

c. Preliminary drafts of curriculum content should be developed through a study of the present and future job requirements in the occupational fields selected and the allocation of the required knowledge, skills and understandings to courses of instruction.[4]

d. The depth and scope of mathematics and science must be tailored to occupational needs of those enrolled.

e. The difficulty level should be such that it can be mastered by a reasonably high proportion of the students within the time limits of the curriculum.

f. The curriculum should be flexible enough to be easily revised as needed in advance of the changing competencies of the technician.

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[3]Received less than a mean rating of 3.00 by the institutions.

[4]Received less than a mean rating of 3.00 by the institutions.

g. Curriculum content should be planned with advice, counsel and support of the agricultural industry for which the training program is being developed. Other agricultural education leaders should also be involved.

h. The curricula for the agricultural technician training programs should be coordinated with the total institution program.

Recruitment

GUIDELINE: A planned recruitment program should be developed to acquaint prospective students with the opportunities for becoming trained as agricultural technicians and for employment upon successful completion of this program.

a. The recruitment program should include activities with the following groups:

(1) High school counselors, teachers and administrators.

(2) High school students.

(3) Agricultural industries, businesses and associations.

(4) Parents of high school students.

(5) Other agricultural organizations and agencies.[5]

b. Specific responsibility for giving leadership to recruitment activities should be assigned.

c. Personal contacts with individuals and/or groups of prospective students should be made and maintained.

d. Emphasis in recruitment activities should be based upon fitting the talents and interests of the prospective student to the technician job.

---

[5]Received less than a mean rating of 3.00 by the institutions.

e. Recruiting efforts should clearly show how the training program is essential to securing a job as a technician.

Selection

GUIDELINE: Selection of students for agricultural technician training programs should be based on interests, aptitudes, previous education, intellectual capacity and background experience - the criteria varying with the occupations for which training is given.

a. Prospective students should be interviewed and appraised with respect to personal traits, physical handicaps and the like in relation to the job of technician.

b. Policies and procedures for student selection should be carefully developed to assure admission of only qualified students.

c. Only those applicants who have a reasonable chance of success in the training program should be admitted.

d. Self-selection by the prospective student should be a significant part of the selection process.[6]

e. An adequate testing program is important in selection.

Counseling

GUIDELINE: Institutions providing agricultural technician training programs should develop an adequate counseling and guidance program, coordinating it with counseling programs of local schools and the Employment Security Commission.

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[6]Received less than a mean rating of 3.00 by the institutions.

a. Counseling services should be made available for the following levels of counseling:

(1) Counseling prior to enrollment

(2) Advisor counseling regarding courses, requirements, study techniques, student organizations and the like.

b. A trained guidance counselor should be provided to give leadership to and coordinate guidance activities.

c. The counseling and guidance service should provide the following:

(1) A placement service.

(2) A vocational information service.

(3) A follow-up and research service.[7]

(4) A counseling service.[8]

Placement and follow-up

GUIDELINE: Placement and follow-up services in agricultural technician training programs should result in graduates being placed in the jobs for which they were prepared and also provide information for proper analysis of program effectiveness.

a. An organized and well-planned placement service should be made available to graduates of agricultural technician training programs.

b. Placement personnel should have extensive contacts with agricultural businesses and industries.

c. Records of employment are essential and should be used for analyzing program effectiveness.

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[7]Received less than a mean rating of 3.00 by the institutions.

[8]Received less than a mean rating of 3.00 by the institutions.

d. Good relationships with prospective employers of graduates should be developed long before actual placements are made.

e. Institutions preparing agricultural technicians should locate desirable placement opportunities for graduates.

f. Up-to-date placement records should be kept for use in public relations, recruitment and counseling.

Residence facilities

GUIDELINE: Residence facilities should be made available for students enrolled in agricultural technician training programs when sufficient need is demonstrated based on the opportunity of students to obtain programs of their choice which are not available to them otherwise and when the addition of these facilities serves as a means to enable the institution to more fully meet its objectives.[9]

a. The following factors should be considered when determining whether residence facilities should be provided:

(1) Geographic location of the institution.

(2) The possibility of placing agricultural technician training in an educational institution within commuting distance.[10]

(3) The institution's objectives.

(4) The number of students needing housing.

b. The library should be well-equipped with:

(1) Reference books.

(2) Technical publications developed by manufacturers of agricultural equipment.

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[9]The guideline received a mean rating of less than 3.00 by the jury.

[10]Received less than a mean rating of 3.00 by the institutions.

(3) Technical periodicals in agriculture.

(4) Pertinent agricultural research bulletins (both publicly and privately sponsored research).

(5) Pertinent government publications in agriculture.

(6) References on economics.

Instructional staff

GUIDELINE: The instructional staff in agricultural technician training programs should have technical occupational competence in the area for which training is offered and should understand and be proficient in teaching skills and competence essential to successful performance as an agricultural technician.

a. Potential instructors should have adequate backgrounds of technical training, technical experience and appropriate teacher training.

b. An adequate number and variety of instructors should be provided.

c. Adequate funds should be provided to meet the competition of industry for the talents of qualified personnel on the instructional staff.

d. In-service training should be provided for the instructional staff.

e. The agricultural technician teacher:

(1) Should be able to establish rapport with students.

(2) Should know how to teach technical subjects.

(3) Should be proficient in applicable manual skills and the use of tools.

(4) Needs a thorough knowledge of the principles and laws of science and mathematics.

(5) Should be a perpetual student as well as mentor.

Facilities and equipment

GUIDELINE: Adequate and appropriate facilities and equipment are essential and should be made available in the training of highly competent agricultural technicians.

a. In the planning of all facilities, the objectives of the program should be kept in mind.

b. An adequate number of various types of well-equipped classrooms should be provided.

c. Facilities and equipment should be available for the student to learn to use the precision instruments, the hand and machine tools, materials, processes and operations involved in the technician occupations for which training is given.

d. Equipment lists should be derived from the content of the courses of study which make up the curriculum.

e. Laboratories should be well-equipped for extensive use for testing, research, experiments and so that instruction can be based on the application of a particular science to industrial processes.

Acceptance

GUIDELINE: Planned and continuous efforts should be made to increase the acceptance and prestige of technician occupations (including agricultural technicians) and technician training programs.

a. Close and continuous contact with industry is desirable.

b. Counselors, other educators and parents should be educated to the fact that technician education is not a "second best" education.

c. The institution should develop and maintain good community relations.

d. "Satisfied customers" should be used to increase acceptance of the program.

e. Planned efforts to increase prestige of technician occupations and technician training programs should be made.

f. An associate degree or other appropriate form of recognition should be awarded graduates to increase the status of the program.

Evaluation

GUIDELINE: Continuous and planned programs of evaluation should be characteristic of agricultural technician training programs.

a. Program evaluation should involve students, graduates of the program, employers of graduates, potential employers and others.

b. Adequately planning for continuous and comprehensive evaluation is an integral part of program planning.

c. Evaluation procedures should provide for objective evaluation of both the processes and the products of agricultural technician training programs.

d. Evaluation should be concerned with the future as well as the past and present.

Accreditation and licensing

GUIDELINE: Agricultural technician training programs should become accredited and/or licensed as early as possible by a

recognized accrediting or licensing agency in order to assure the public that some kinds of recognized standards are being met and to protect graduates from pseudo-technician graduates.

a. Copies of the criteria for accreditation and/or licensing should be secured as early as possible and efforts made to meet them.[11]

Location

GUIDELINE: Agricultural technician training programs should be located in institutions in areas of population and agricultural industry and business concentration so as to be readily accessible to those whom they are designed to serve.

a. The program should be located where similar type training is not already offered by other institutions in the area.

b. Location of the program should be made only after a survey of need, interest and resources is made and evaluated.

c. The institution in which the program is located should lend itself to serving a commuting population of a number of full-time students.[12]

d. The program should be located in an area where students might get first hand observation of and/or work experience in the cluster of occupations for which the training is being given.

---

[11]Received less than a mean rating of 3.00 by the institutions.

[12]Received less than a mean rating of 3.00 by the institutions.

Conclusions

The following conclusions were drawn by the investigator, based on his interpretation of the data presented in this study.

1. Many four year colleges have set up programs for the training of agricultural technicians in connection with their colleges of agriculture. Most of the agricultural technicians currently being trained are in these types of institutions.

2. Training programs for agricultural technicians are rapidly developing in other types of institutions, however, and will be developed at an increasing rate during the next five years.

3. Training programs for agricultural technicians are being developed primarily in two types of institutions other than those mentioned, in technical institutes and junior colleges. To a lesser extent some types of programs are being developed in comprehensive community colleges and area vocational-technical schools.

4. Most of the training programs for agricultural technicians currently in operation have extremely small enrollments but these enrollments should increase as these programs become better established and more well known.

5. Local boards of trustees or local boards of education are policy making bodies for most institutions in which there are training programs for agricultural technicians.

6. Most training programs for agricultural technicians are two years in duration and lead to the Associate in Applied Science Degree. Some training programs are being set up so that courses taken in these programs might be transferred to other institutions and applied toward degrees.

7. Training programs for agricultural technicians are primarily located in institutions receiving state appropriations to help meet current operating expenses, expenses for equipment purchases and expenses for buildings and other capital outlay.

8. Objectives of programs for training agricultural technicians should lead to curriculums that are primarily occupation-centered, planned toward occupational competence of the graduate and prepare the student for immediate productive employment.

9. The type(s) of program(s) to be offered in a particular institution or location should be determined only after a very careful survey of occupational, educational and interest needs of the people in the area to be served by the sponsoring institution.

10. Recruitment of students is one of the critical factors in the development of training programs for agricultural technicians. A great deal of emphasis should be given to this area and recruitment programs planned. Recruitment for these programs will become easier as the programs become more well established and the status of technical occupations and technical education programs at this level raised.

11. Another critical factor in the successful development of effective training programs for agricultural technicians is the selection of a highly competent instructional staff who can provide training in the highly technical skills as well as broad supporting knowledge and skills. Staff size for some of the programs currently in operation severely limit this being done. Programs developed in connection with and on the campuses of four year colleges of agriculture appear to be ideally situated in terms of having a larger instructional staff from which to draw.

12. Facilities and equipment for training programs for agricultural technicians should give emphasis to the development of cognitive rather than manipulative skills and be designed for extensive use for testing, research and experiments.

13. Location of programs for the training of agricultural technicians should receive major consideration in the development of programs as this affects program objectives, availability of potential students, instructional staff, and other critical factors in the successful development of training programs.

14. The procedures used in the instrument with institutions are procedures that should prove to be of value to administrators planning for training programs for agricultural technicians. The degree of emphasis which should be given to each procedure will vary with the type of institution in which the program is located.

15. The guidelines developed in this study are usable and have been rated as important considerations in the successful development of training programs for agricultural technicians. The supporting statements for each guideline provide suggestions for implementing the guidelines.

APPENDIX A

Questionnaire for Institutions

Please complete
and return by
February 19, 1964

PART I

THE INSTITUTION AND SETTING

The purpose of this section is to determine the types and nature of institutions with one or more curriculums designed specifically to train agricultural technicians. Please complete all items as accurately as possible.

1. Name of the institution _____

2. Mailing address of the institution _____

_____

3. Type of institution (Please check the item below which most accurately describes your institution):

_____ Technical Institute _____ Area Vocational-Technical School

_____ Junior College _____ Comprehensive Community College

_____ Other (Please identify) _____

4. Enrollment of the institution: Full-time students: Men _____ Women _____

Part-time students: Men _____ Women _____

How do you distinguish between full-time and part-time students: ____

_____

Extension students: Men _____ Women _____

5. Administering agency (e.g., Local Board of Education _____; State Board of Education _____; Board of Trustees _____; Other (Please identify) _____

6A. Types of agricultural technician training programs in operation in your institution and information concerning each program:

	Name of Agricultural Technician Training Program	Year program started	Number Students: Enrolled in first class	Who have completed this program	Placed in jobs for which trained	Who began program this fall	Currently enrolled (include advanced students)
Ex.	0. Agricultural Computations Technology	1959	14	28	20	18	31
	1.						
	2.						
	3.						
	4.						

How were prospective students identified? _____

_____

6B. Types of agricultural technician training programs currently in the planning stage:

	Name of Agricultural Technician Training Program	Year in Which Program is Expected to be Initiated
1.		
2.		
3.		
4.		

7A. Source of funds for current operation expenses for the agricultural technician training program(s): (Teachers' salaries, supplies, equipment repairs, etc. Do not include major equipment purchases or other capital outlay.) (Indicate approximate percentage of these funds being received from the following sources.)

a. Local taxes ____% d. Private industry ____%

b. State appropriations ____% e. Student tuition and/or fees ____%

c. NDEA funds ____% f. Other (Please specify):

_____ ____%

Total 100 %

B. Source of funds for equipment purchases:

a. Local taxes ____% d. Private industry ____%

b. State appropriations ____% e. Student tuition and/or fees ____%

c. NDEA funds ____% f. Other (Please specify):

_____ ____%

Total 100 %

C. Source of funds for buildings and other capital outlay (excluding equipment):

a. Local taxes ____% d. Private industry ____%

b. State appropriations ____% e. Student tuition and/or fees ____%

c. NDEA funds ____% f. Other (Please specify): ____%

_____ ____%

Total 100 %

8. List institutions in your area which accept credit given by your institution for agricultural technician training program courses and allow this credit to be applied toward a degree.

_____ _____

_____ _____

9. Is an award given upon the successful completion of the agricultural technician training program? Yes _____ No _____. If yes, please indicate type: Associate Degree _____ Diploma _____ Certificate _____ Other (Please specify) _____
Are they eligible for license? Yes _____ No _____.

10. What titles (such as Associate in Arts or Agricultural Implements Technician), if any, are given or assigned to the persons successfully completing the agricultural technician training program? _____

_____ _____

11. a. Is your institution licensed? Yes _____ No _____. If yes, please indicate the licensing agency:

_____

b. Is your institution accredited? Yes _____ No _____. If yes, please indicate the accrediting agency:

_____

c. Are your agricultural technician training programs accredited? Yes _____ No _____. If yes, indicate accrediting agency:

_____

_____

12. Student services: (Please check appropriate column for your institution)

Student Services (Prospective Students)	Available	Not Available but Should Be	Not Needed
a. Brochures and other recruitment materials	_____	_____	_____
b. A planned recruitment program	_____	_____	_____
c. Guidance and counseling services	_____	_____	_____
(Enrolled Students)			
a. Financial assistance programs	_____	_____	_____
b. Faculty advisers for students	_____	_____	_____
c. Dormitory accommodations	_____	_____	_____

	Available	Not Available but Should Be	Not Needed
d. Campus eating facilities	_____	_____	_____
e. Guidance and counseling services	_____	_____	_____
(Graduates)			
a. Placement services	_____	_____	_____
b. In-service programs	_____	_____	_____
c. Guidance and counseling	_____	_____	_____

13. Instructional staff -- specialty instructors for agricultural technician training programs (do not include related courses instructors):

a. Number instructors: Full-time _____ Part-time _____

b. Number full-time instructors with Bachelors' _____ Masters' _____ Doctors' _____ Degrees. Number non-degree full-time instructors _____. Number full-time instructors with job experience in the technician area in which teaching _____.

c. Number part-time instructors with Bachelors' _____ Masters' _____ Doctors' _____ Degrees. Number non-degree part-time instructors _____. Number part-time instructors with job experience in the technician area in which teaching _____.

d. Other people in the administrative structure who devote a per cent or all of their time to agricultural technician training:

Title of Person	Per Cent of Time
_____	_____
_____	_____
_____	_____

PART II

PROCEDURES IN DEVELOPING AGRICULTURAL TECHNICIAN TRAINING PROGRAMS

INSTRUCTIONS: There are two general purposes for Part II of this instrument. One is to identify any procedures not listed but which you feel important to the successful development of agricultural technician

training programs. Please add these in the spaces provided. The second purpose is to determine the amount of emphasis which you believe should be given to each procedure in developing successful agricultural technician training programs.

A scale is provided to record your reaction to each procedure in terms of the amount of emphasis which you believe should be given to the procedure in developing successful agricultural technician training programs.

Following each procedure is a set of numerical values (4-3-2-1-0) labeled (E). These numbers correspond to the alternatives in the scale below. Please circle the value on the scale which most nearly indicates your reaction to each procedure in terms of the question below:

QUESTION: In attempting to develop successful agricultural technician training programs, what degree of emphasis should be given to this procedure?

EMPHASIS SCALE

Very Much	Much	Some	Little	None
4	3	2	1	0

Section I. Objectives of the Program

	PROCEDURE	SCALE
1.	Development of clearly defined and realistic objectives for the training programs under the guidance of a professional educator assigned to give leadership to this area.	(E) 4 3 2 1 0
2.	Development of objectives with which lay personnel in the agricultural businesses and industries are in general accord.	(E) 4 3 2 1 0
3.	Development of objectives which assure that training programs would prepare students for immediate productive employment in the technician occupations for which training is provided.	(E) 4 3 2 1 0
4.	Development of broad objectives which allow training for a cluster of related occupations.	(E) 4 3 2 1 0
5.	Development of objectives to assure that resulting curricula are occupation-centered and planned toward occupational competence of the graduate.	(E) 4 3 2 1 0
6.	Development of objectives in harmony with the legal bases on which the institution is founded.	(E) 4 3 2 1 0
7.	_____	(E) 4 3 2 1 0

EMPHASIS SCALE

Very Much	Much	Some	Little	None
4	3	2	1	0

Section II. Types of Programs Offered

PROCEDURE	SCALE
1. Careful planning, including the use of an advisory committee with representatives from agricultural businesses and industries, preceded any occupational, educational and interest surveys that are made.	(E) 4 3 2 1 0
a. Deciding on the main purpose to be served by each survey before the instruments for it are developed.	(E) 4 3 2 1 0
b. Deciding on the precise information desired and the development of instruments to assure its being obtained.	(E) 4 3 2 1 0
c. Careful selection of sources of information.	(E) 4 3 2 1 0
d. Careful selection of well-qualified person to direct the survey.	(E) 4 3 2 1 0
e. Obtaining consultant help in field research in developing the survey plan and guide.	(E) 4 3 2 1 0
f. Budgeting sufficient funds and/or time for making the surveys.	(E) 4 3 2 1 0
2. Conducting valid surveys which provide extensive and dependable information and data needed.	
a. Determining the types and number of employment opportunities currently available and those realistically expected over a given period of time.	(E) 4 3 2 1 0
b. Identifying other available sources of information and training for the particular areas under consideration.	(E) 4 3 2 1 0
c. Determining the number of potential students who are presently interested in and who would enroll in the program.	(E) 4 3 2 1 0

EMPHASIS SCALE

Very Much	Much	Some	Little	None
4	3	2	1	0

PROCEDURE	SCALE
d. Determining the number of potential students who could possibly be made interested in enrolling in the program.	(E) 4 3 2 1 0
e. Identifying jobs or occupational clusters dependent upon agricultural technician training programs.	(E) 4 3 2 1 0
f. Determining the amount of support employers would give to the program.	(E) 4 3 2 1 0
g. Gathering other types of information needed to make decisions on the types of programs to be offered.	(E) 4 3 2 1 0
3. Careful analysis of survey findings to determine what agricultural technician training programs should be established.	
a. Securing specialized consultant help in analyzing and interpreting the survey data.	(E) 4 3 2 1 0
b. Involving advisory committees in analyzing and interpreting the data.	(E) 4 3 2 1 0
4. _____	(E) 4 3 2 1 0

Section III. Curriculum Content

1. Analysis of agricultural technician jobs to assure that curriculum content is primarily occupation-centered.	(E) 4 3 2 1 0
2. Provision of a skilled technical education analyst to supervise the analysis of the technician jobs and the allocation of the required knowledge, skills and understanding to preliminary drafts of courses of instruction.	(E) 4 3 2 1 0
3. Securing advice, counsel and support of agricultural and educational leaders and of the agricultural industry for which the training program is being developed in order to plan curriculum content.	(E) 4 3 2 1 0

EMPHASIS SCALE

Very Much	Much	Some	Little	None
4	3	2	1	0

	PROCEDURE	SCALE
4.	Achieving a balance between technical-supporting content and class-laboratory experiences.	(E) 4 3 2 1 0
5.	Tailoring the depth and scope of mathematics and science to the occupational needs of those enrolled.	(E) 4 3 2 1 0
6.	Determining the difficulty level to be achieved.	(E) 4 3 2 1 0
7.	Coordination of the curricula with the total institution program.	(E) 4 3 2 1 0
8.	Making the curriculum flexible enough to be easily revised as needed in advance of the changing competencies of the technician.	(E) 4 3 2 1 0
9.	Making work experience as a technician helper a part of the curriculum.	(E) 4 3 2 1 0
10.	_____	(E) 4 3 2 1 0

Section IV. Student Services

(a). Recruitment (of Prospective Students)

1.	The development of a well planned recruitment program including activities with the following groups:	
	a. High school students	(E) 4 3 2 1 0
	b. High school counselors, teachers and administrators	(E) 4 3 2 1 0
	c. Parents of high school students	(E) 4 3 2 1 0
	d. Agricultural industries, businesses and associations	(E) 4 3 2 1 0
	e. Other agricultural organizations and agencies	(E) 4 3 2 1 0
	f. The general public	(E) 4 3 2 1 0

EMPHASIS SCALE

Very Much	Much	Some	Little	None
4	3	2	1	0

	PROCEDURE	SCALE
2.	Assignment of specific responsibility for giving leadership in recruitment activities.	(E) 4 3 2 1 0
3.	Preparation of materials for use by mass media such as newspaper, radio and television.	(E) 4 3 2 1 0
4.	The making of individual personal contact and/or contact and follow-up of all identified interested prospects for enrollment.	(E) 4 3 2 1 0
5.	Giving emphasis to the fitting of talents and interest of prospective students to technician jobs.	(E) 4 3 2 1 0
6.	Clearly showing that the training program is essential to the securing of a job as a technician.	(E) 4 3 2 1 0
7.	_____	(E) 4 3 2 1 0

(b). Selection (of Students)

1.	Careful development of student selection policies and procedures to assure admission of only qualified student.	(E) 4 3 2 1 0
2.	Interviewing and appraising prospective students with respect to personal traits, physical handicaps and the like in relation to the job of the technician.	(E) 4 3 2 1 0
3.	Development of an adequate testing program.	(E) 4 3 2 1 0
4.	Selection of only those applicants who have a reasonable chance of success in the training program.	(E) 4 3 2 1 0
5.	Use of self-selection by the student as a significant part of the selection program.	(E) 4 3 2 1 0
6.	_____	(E) 4 3 2 1 0

EMPHASIS SCALE

Very Much	Much	Some	Little	None
4	3	2	1	0

	PROCEDURE	SCALE
	(c). Counseling	
1.	Provision of counseling services:	
	a. Prior to enrollment.	(E) 4 3 2 1 0
	b. Concerning facilities, schedules and the like.	(E) 4 3 2 1 0
	c. By advisors regarding courses, requirements, study techniques, student organizations, and the like.	(E) 4 3 2 1 0
	d. Involving personal problems.	(E) 4 3 2 1 0
	e. By fully trained workers such as psychologists or vocational counselors.	(E) 4 3 2 1 0
2.	Provision of a trained guidance counselor to give leadership to and coordinate guidance activities.	(E) 4 3 2 1 0
3.	Provision of the following counseling and guidance services:	
	a. Vocational information service.	(E) 4 3 2 1 0
	b. Personal data collecting service.	(E) 4 3 2 1 0
	c. Counseling service.	(E) 4 3 2 1 0
	d. Follow-up and research service.	(E) 4 3 2 1 0
	e. Placement service.	(E) 4 3 2 1 0
4.	Provision of an adequate testing program for counseling purposes.	(E) 4 3 2 1 0
5.	_____	(E) 4 3 2 1 0

EMPHASIS SCALE

Very Much	Much	Some	Little	None
4	3	2	1	0

PROCEDURE	SCALE
(d). Placement and Follow-up (of Graduates)	
1. Development of a well-planned placement service and procedures.	(E) 4 3 2 1 0
2. Assuring that placement service personnel have extensive contacts with agricultural businesses and industries.	(E) 4 3 2 1 0
3. Location of desirable placement opportunities upon completion of the program.	(E) 4 3 2 1 0
4. Development of good relationships with prospective employers of graduates long before actual placements are made.	(E) 4 3 2 1 0
5. Development of employment records for use in analyzing program effectiveness.	(E) 4 3 2 1 0
6. Use of up-to-date placement records in public relations, recruitment and counseling.	(E) 4 3 2 1 0
7. _____	(E) 4 3 2 1 0
(e). Residence Facilities	
1. Consideration of the following factors when determining whether to provide residence facilities:	
a. Possibility of placing agricultural technician training in an educational institution within commuting distance.	(E) 4 3 2 1 0
b. The institution's objectives.	(E) 4 3 2 1 0
c. Extent to which housing is a suitable medium for the achievement of educational objectives.	(E) 4 3 2 1 0
d. Number of students needing housing.	(E) 4 3 2 1 0

EMPHASIS SCALE

Very Much	Much	Some	Little	None
4	3	2	1	0

	PROCEDURE	SCALE
e.	Available rooming facilities near the campus.	(E) 4 3 2 1 0
f.	Financial resources of students.	(E) 4 3 2 1 0
g.	Financing plans available.	(E) 4 3 2 1 0
h.	Stability of enrollment.	(E) 4 3 2 1 0
i.	Geographic location of the institution.	(E) 4 3 2 1 0
j.	Availability of adequate transportation.	(E) 4 3 2 1 0
k.	_____	(E) 4 3 2 1 0

Section V. Library

1.	Making available sufficient funds to supply the library adequately with:	
a.	Reference books.	(E) 4 3 2 1 0
b.	Technical periodicals in agriculture.	(E) 4 3 2 1 0
c.	Technical publications developed by manufacturers of agricultural equipment.	(E) 4 3 2 1 0
d.	Pertinent government publications in agriculture.	(E) 4 3 2 1 0
e.	Pertinent agricultural research bulletins (both publicly and privately sponsored research).	(E) 4 3 2 1 0
f.	References on automation.	(E) 4 3 2 1 0
g.	References on economics.	(E) 4 3 2 1 0
h.	References on manpower.	(E) 4 3 2 1 0
2.	Making the institution library readily accessible for use by students in the agricultural technician training program.	(E) 4 3 2 1 0
3.	_____	(E) 4 3 2 1 0

EMPHASIS SCALE

Very Much	Much	Some	Little	None
4	3	2	1	0

PROCEDURE	SCALE
Section VI. Instructional Staff	
1. Securing instructors with adequate backgrounds of technical training, technical experience and appropriate teacher training.	(E) 4 3 2 1 0
2. Securing instructors:	
a. With a thorough knowledge of the principles and laws of science and mathematics.	(E) 4 3 2 1 0
b. Proficient in the applicable manual skills and the use of tools.	(E) 4 3 2 1 0
c. Proficient in the linguistic skills and social sciences.	(E) 4 3 2 1 0
d. Who are perpetual students as well as mentors.	(E) 4 3 2 1 0
e. Who know how to teach technical subjects.	(E) 4 3 2 1 0
f. Who are able to establish rapport with students.	(E) 4 3 2 1 0
3. Providing adequate funds to meet the competition of industry for the talents of qualified personnel on the instructional staff.	(E) 4 3 2 1 0
4. Provision of the number and variety of instructors needed.	(E) 4 3 2 1 0
5. Provision of in-service training to the instructional staff.	(E) 4 3 2 1 0
6. _____	(E) 4 3 2 1 0
Section VII. Facilities and Equipment	
1. Planning the facilities and equipment in keeping with the objectives of the program.	(E) 4 3 2 1 0

EMPHASIS SCALE

Very Much	Much	Some	Little	None
4	3	2	1	0

	PROCEDURE	SCALE
2.	Provision of facilities and equipment necessary for the students to learn to use the precision instruments, the hand and machine tools, materials, processes and operations involved in the technician occupations for which training is given.	(E) 4 3 2 1 0
3.	Provision of well-equipped laboratories for testing, research, experimentation and the application of a particular science to industrial processes.	(E) 4 3 2 1 0
4.	Adequately equipping the shops and laboratories from lists derived from the content of the courses of study making up the curriculum.	(E) 4 3 2 1 0
5.	Provision of an adequate number and types of well-equipped classrooms.	(E) 4 3 2 1 0
6.	_____	(E) 4 3 2 1 0

Section VIII. Acceptance

1.	Planning efforts to increase prestige of technician occupations and technician training programs.	(E) 4 3 2 1 0
2.	Educating counselors, other educators and parents to the fact that technician education is not "second best" education.	(E) 4 3 2 1 0
3.	Developing and maintaining good community relations.	(E) 4 3 2 1 0
4.	Developing and maintaining close and continuous contact with industry.	(E) 4 3 2 1 0
5.	Using "satisfied customers" to increase acceptance of the program.	(E) 4 3 2 1 0
6.	Awarding an associate degree or other appropriate recognition to graduates.	(E) 4 3 2 1 0
7.	_____	(E) 4 3 2 1 0

EMPHASIS SCALE

Very Much	Much	Some	Little	None
4	3	2	1	0

PROCEDURE	SCALE
Section IX. Evaluation	
1. Adequately planning for continuous and comprehensive evaluation.	(E) 4 3 2 1 0
2. Developing evaluation procedures which provide for objective evaluation of both the processes and the products of the agricultural technician training programs.	(E) 4 3 2 1 0
3. Involving students, graduates of the program, employers of graduates, potential employers and others in program evaluation.	(E) 4 3 2 1 0
4. Making the evaluation concern the future as well as the past and present.	(E) 4 3 2 1 0
5. _____	(E) 4 3 2 1 0
Section X. Accreditation and/or Licensing	
1. Locating an appropriate accrediting and/or licensing agency for the agricultural technician training programs as soon as the need for such programs are identified.	(E) 4 3 2 1 0
2. Investigating the requirements for accreditation and/or for licensing and attempting to meet these requirements.	(E) 4 3 2 1 0
3. Budgeting funds for accreditation expenses and/or for licensing fees.	(E) 4 3 2 1 0
4. Widely publicizing the accreditation and/or licensing of the local program.	(E) 4 3 2 1 0
5. _____	(E) 4 3 2 1 0
Section XI. Location	
1. Locating the program in an institution situated in an area of population concentration.	(E) 4 3 2 1 0

EMPHASIS SCALE

Very Much	Much	Some	Little	None
4	3	2	1	0

	PROCEDURE	SCALE
2.	Locating the program in an institution situated so as to serve a commuting population of a number of full-time students.	(E) 4 3 2 1 0
3.	Locating the program in an institution where similar type training is not already offered by other institutions in the area.	(E) 4 3 2 1 0
4.	Locating the program where students might get first hand observation of and/or work experiences in the cluster of occupations for which the training is being given.	(E) 4 3 2 1 0
5.	Locating the program based on results of a survey of need, interest and resources.	(E) 4 3 2 1 0
6.	_____	(E) 4 3 2 1 0

APPENDIX B

INSTITUTIONS PARTICIPATING IN THE STUDY

Abraham Baldwin Agricultural College, Tifton, Georgia

Catawba Valley Technical Institute, Newton, North Carolina

Cobleskill Agricultural and Technical Institute, Cobleskill, New York

East Central Junior College, Decatur, Mississippi

Essex Agricultural and Technical Institute, Hathorne, Massachusetts

Hinds Junior College, Raymond, Mississippi

Lake City Junior College and Ranger School, Lake City, Florida

Modesto Junior College, Modesto, California

Mt. San Antonio Junior College, Walnut, California

Murray State Agricultural College, Tishomingo, Oklahoma

Northeastern Junior College, Sterling, Colorado

Northern Montana College, Havre, Montana

Skagit Valley College, Mount Vernon, Washington

Springfield and Clark County Technical Education Program, Springfield, Ohio

State University Agricultural and Technical Institute at Alfred,
Alfred, New York

State University Agricultural and Technical Institute at Farmingdale,
Farmingdale, L. I., New York

State University Agricultural and Technical Institute, Morrisville,
New York

State University of New York Agricultural and Technical Institute,
Canton, New York

State University of New York Agricultural and Technical Institute,
Delhi, New York

Sussex Vocational-Technical Center, Georgetown, Delaware

Vermont Technical College, Randolph Center, Vermont

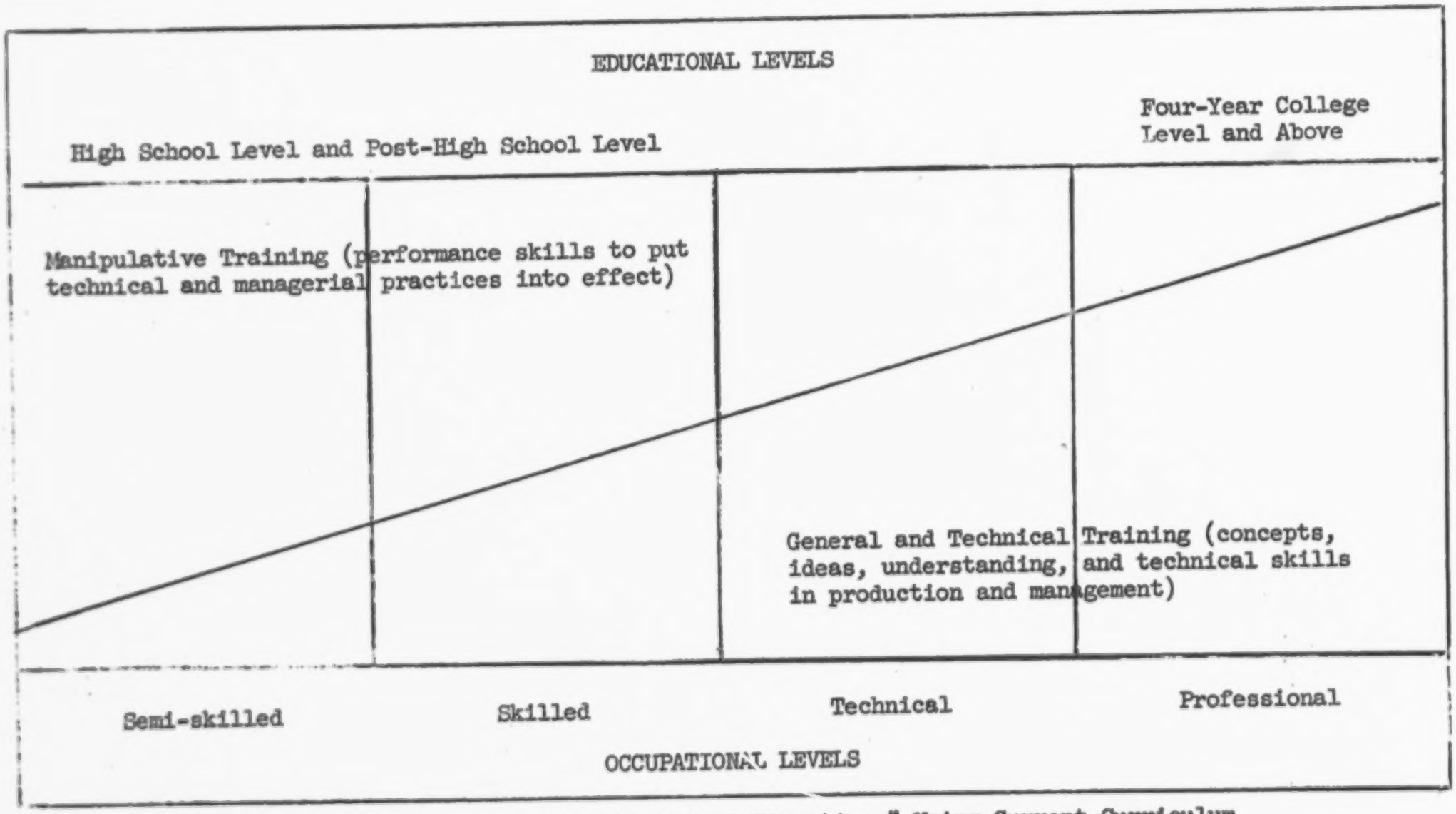
Wausau Technical Institute, Wausau, Wisconsin

Wayne County Technical Institute, Goldsboro, North Carolina

Wilson County Technical Institute, Wilson, North Carolina

Yakima Valley College, Yakima Valley, California

Proportions of Two Types of Training in Educational Programs for Different Occupational Levels


EDUCATIONAL LEVELS
High School Level and Post-High School Level
Four-Year College Level and Above
Manipulative Training (performance skills to put technical and managerial practices into effect)
General and Technical Training (concepts, ideas, understanding, and technical skills in production and management)
Semi-skilled
Skilled
Technical
Professional
OCCUPATIONAL LEVELS

Source: Gerald B. James, "Vocational and Technical Education," Using Current Curriculum Developments (Washington: Association for Supervision and Curriculum Development, National Education Association, 1963), p. 89.

Suggested Criteria for Identifying Technician Occupations

If the majority of the following items are checked in the affirmative, the occupation may be classified as of technician character.

Does the occupation require intensive training in technical subjects involving the direct application of specialized functional aspects of science, mathematics, and advanced technical skills and information based upon: Yes____ No____

____a. Analysis and diagnosis of situations and problems requiring technical understanding.

____b. The ability to use standard technical handbooks and similar materials effectively.

____c. Frequent decisions with respect to technical problems.

____d. Concern with a variety of technical situations often involving many factors and variables.

____e. The use of a variety of instruments.

____f. Interpretation of plans and drawings.

____g. Visualization and creative design.

____h. An understanding of equipment.

____i. An understanding of materials and processes.

____j. Cost analysis in addition to technical understanding and technical skill.

____k. The ability to render technical assistance to engineers, scientists, or other professional personnel engaged in scientific research or production.

____l. The ability to supervise or communicate with others effectively in oral and written form, including the use of graphics, in matters pertaining to technical activities.

Source: Lynn A. Emerson, Technician Training Beyond the High School (Raleigh: Vocational Materials Laboratory, Division of Vocational Education, North Carolina Department of Public Instruction, 1962), p. 16.

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